



Lithospheric transition from the stable Iberia Variscan domain to the Alpine deformed Gibraltar Arc and Atlas mountains

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The present-day density and compositional 2D structure of the lithosphere is studied along a ~950-km-long transect crossing the Gibraltar Arc System and Atlas Mountains. The transect runs from the tectonically stable Variscan Iberian Massif (North) to the deformed alpine tectonic domains of the Gibraltar Arc System and the Atlas intracontinental orogenic belt (South). Both domains are located in the westernmost continental segment of the African-Eurasian plates, a segment which is characterized by a diffuse transpressive contact between both plates. An integrated and self-consistent geophysical-petrological methodology (LitMod2d), recently improved by Kumar et al (2018, this meeting), is used to model the along transect variations of the structure and thermophysical properties of the lithosphere and sublithospheric mantle. The crust is mainly constrained by active and passive-source seismic experiments and available geological data, whereas the composition of the lithospheric mantle is constrained by xenolith data and tomography models. Results highlight large lateral variations in the topography of the lithosphere-asthenosphere boundary (LAB). We distinguish different chemical lithospheric mantle domains that reproduce the main trends of the geophysical observables and the recorded P-, Pn- and S-wave seismic velocities. Low-velocity/high-temperature/low-density sublithospheric mantle domains are required to fit the observed mean topography and tomography data.

Kumar, A., Fernàndez, M., Jimenez-Munt I., Torne, M., Verges, J. (2018). New improvements on LitMod package: A tool for integrated geophysical-petrological modelling of the lithosphere and upper mantle. (This meeting).

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